

United States Department of the Interior  
 National Park Service

# National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

## 1. Name of Property

Historic name: Kalauao Springs Bridge

Other names/site number: Kalauao Spring Bridge  
Kalauao Springs Eastbound Bridge & Kalauao Springs  
Westbound Bridge

Name of related multiple property listing:

\_\_\_\_\_  
 (Enter "N/A" if property is not part of a multiple property listing)

## 2. Location

Street & number: Kamehameha Highway and Kalauao Springs

City or town: Aiea State: Hawaii County: Honolulu

Not For Publication:  Vicinity:

## 3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this \_\_\_ nomination \_\_\_ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property \_\_\_ meets \_\_\_ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

\_\_\_ national \_\_\_ statewide **X** local

Applicable National Register Criteria:

**X** \_\_\_ A \_\_\_ B \_\_\_ C \_\_\_ D

_____ <b>Signature of certifying official/Title:</b>	_____ <b>Date</b>
_____ <b>State or Federal agency/bureau or Tribal Government</b>	

In my opinion, the property ___ meets ___ does not meet the National Register criteria.	
_____ <b>Signature of commenting official:</b>	_____ <b>Date</b>
_____ <b>Title :</b>	_____ <b>State or Federal agency/ bureau or Tribal Government</b>

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#### 4. National Park Service Certification

I hereby certify that this property is:

- entered in the National Register
- determined eligible for the National Register
- determined not eligible for the National Register
- removed from the National Register
- other (explain:) \_\_\_\_\_

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Signature of the Keeper

Date of Action

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#### 5. Classification

##### Ownership of Property

(Check as many boxes as apply.)

- Private:
- Public – Local
- Public – State
- Public – Federal

##### Category of Property

(Check only **one** box.)

- Building(s)
- District
- Site
- Structure
- Object



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## 7. Description

### Architectural Classification

(Enter categories from instructions.)

Other, Bridge

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**Materials:** (enter categories from instructions.)

Principal exterior materials of the property: FOUNDATION: Concrete; WALLS: Concrete  
(parapets & stanchions)

### Narrative Description

(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with a **summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

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#### Summary Paragraph

The Kalauao Springs Bridge was built in 1936 as a single two-lane, two-direction reinforced concrete girder bridge was constructed to cross the outflow of Kalauao Springs. Post-war-time activities made the capacity of Kamehameha Highway and this single bridge inadequate, so that in 1945 a second, parallel, bridge was constructed and each of the two structures then carried traffic in a single direction. The structural design of the 1936 and 1945 bridges is not the same, showing the changes in technology over different eras, though both employed a reinforced concrete girder bridge design.

Parapet design of both the 1936 and 1945 bridge is similar, using concrete with cross-shaped voids with concrete stanchions at the ends. The only major visible difference between the 1936 and 1945 bridges is that, the 1936 bridge has at-grade shoulders for pedestrian traffic, while the 1945 bridge has grade-separated concrete pedestrian sidewalks. Moreover, the 1936 stanchions are curved away from traffic and the 1945 stanchions are straight.

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In 1966, both the 1936 and 1945 bridges were widened to add a third lane using stringer multi-beam design, with pre-stressed concrete<sup>1</sup>. The addition of the new lane required the demolition of the outboard walkways and parapets of each bridge. The 1966 parapet design features a concrete lower section, topped with two horizontal cylindrical metal rails. The concrete end stanchions are simple rectangular forms with year built (1966) and name inscriptions. The 1966 alterations left only the center parapets, walkways, and stanchions of the 1936 and 1945 bridges. The condition of the bridge is good. The integrity of the bridge structures have been compromised due to the 1966 bridge expansions and surrounding urbanization.

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<sup>1</sup> National Bridge Inventory Database, Kalauao Spring Bridge, on website nationalbridges.com, accessed May 23, 2012. [The eastbound bridge has a NBI Structure Number of 003000990402053 and the westbound bridge has a NBI Structure Number of 003000990402054.]

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## Narrative Description

Both reinforced-concrete three-lane bridges cross the waterway created by the outflow of Kalauao Springs, also known as Kalauao Springs Ditch (makai of the bridge).<sup>2</sup> Eastbound traffic travels on the makai bridge and the mauka bridge carries westbound traffic. The makai eastbound bridge has a single span of about 40'. The mauka westbound bridge has a more complex design; there are two spans, each approximately 26', on the 1945 section, and a single span of about 51' on the 1966 section. Both the eastbound and westbound bridges have a roadway approximately 40' wide. Each bridge has concrete walkways approximately 4' wide, which are about 4" higher than the roadway surface. The eastbound bridge has walkways along both its mauka (1936) parapet and along its makai (1966) edge, while the westbound bridge has a walkway only along its mauka (1966) parapet. The walkway along the 1936 parapet is now in the highway median and utilized by few pedestrians.

The inner parapet on each bridge is comprised of the original parapet and stanchions, from either 1936 (on the eastbound bridge) or 1945 (on the westbound bridge). This original (1936 and 1945) construction on each bridge includes the structure supporting the two traffic lanes adjacent to the original parapets. The 1966 widening increased the width of each bridge from two to three traffic lanes and built replacement walkways along the new parapets.

### Eastbound Bridge (1936/1966)

This bridge has three eastbound lanes on an asphalt-surfaced roadway. The 1936 concrete parapet and stanchions are on the mauka side of this bridge. This parapet is 2'-10" high and about 40' long. The parapet has a top railing 1'-0" wide and 7" high, with 1½" stepped corners. Below the railing is a series of vertical concrete balusters (6" wide and 6" thick) that are typically spaced at 1'-7" on center. The sections of the parapet between the balusters are slightly thinner (4" thick) and each section has a cross-shaped void. These voids are typical of concrete bridge design in Hawaii during the 1930s and 1940s and are commonly referred to as a Greek-cross shape.<sup>3</sup> Each cross void is 1'-3" high and 8" wide. The base of the 1936 parapet is 7" high and 10" thick, along its full length. Extending along the inboard side of the parapet is a walkway, 3'-0" wide and about 4" higher than the road pavement. The height differential results in an approximately 4"-high concrete curb along the road.

The 1936 concrete end stanchions are 3'-3" high (measured from the roadway), 1'-9" thick, and about 4' long. In plan, they form an arc of a circle spanning about 30 degrees. One end of each stanchion squarely abuts the parapet and the stanchion arcs away from the roadway, presenting a curving face to the traffic lanes. Each stanchion has 1½" stepped corners, with a top surface that is 1'-3" wide. The west stanchion has an added wedge of concrete on its outer (road-facing) surface that anchors a steel W-beam guardrail, which extends along the roadway at the approach.

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<sup>2</sup> State of Hawaii, Taxation Maps Bureau, First Division, Zone 9, Section 8, Plat 14. June 1975.

<sup>3</sup> Heritage Center, School of Architecture, University of Hawai'i at Mānoa [hereafter, Heritage Center], State of Hawai'i, Historic Bridge Inventory and Evaluation (Draft prepared for the State of Hawai'i, Department of Transportation, Highways Division) 2008. p. 1-30.

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Typically, concrete bridges of this type and period have year built and name inscriptions on their end stanchions. However, the concrete wedge covers the name inscription on this stanchion. The east end stanchion has the date inscription "1936" in 3"-high block numbers.

The 1966 parapet and end stanchions of the eastbound bridge are on the makai side of the bridge. The lower part of the 1966 parapet is built of concrete, which is 1'-2" thick and 1'-6" high. There is a horizontal line incised across it, at the height of 9". The upper section of the 1966 parapet is a metal railing composed of two horizontal cylinders supported by slightly curved rail posts. The bottom rail is 5" in diameter and the top rail is 3" in diameter. The posts are spaced about 7' apart along the length of the parapet. The posts are bolted to the top surface of the lower concrete section. The 1966 end stanchions are rectangular concrete, 1'-2" thick, 3'-1" high, and 5'-0" long. Each has 1"-wide horizontal lines scribed around its circumference at heights of 9" and 1'-6" above the walkway. The west stanchion has the inscription "Kalauao Springs Bridge 1966" in 3"-high block lettering. The added steel guardrails partially obscure this inscription.

The substructure of the eastbound bridge was not accessible for observation due to steep embankments, dense underbrush, and water in the channel makai of the bridge. Unlike the many intermittent streams in Hawai'i that sometimes have dry streambeds, this stream is spring fed, so it always has water in it. The 1965 drawings show the abutments, of both the 1936 section and the portion added in 1966, supported by piles. The girders in both the original and newer sections span the 40' distance between abutments, but the 1966 section has prestressed girders, which have a different design than the 1936 cast-in-place girders.<sup>4</sup>

#### Westbound Bridge (1945/1966)

This bridge has the three westbound lanes on an asphalt-surfaced roadway. The 1945 concrete parapet and stanchions are on the makai side of this bridge. This parapet is almost identical to the 1936 parapet described above; however, instead of having a walkway extending along its length, it has a 6"-high, 10"-wide concrete curb. Another difference is the 1945 concrete end stanchions are rectangular, not curved. The newer stanchions are the same height and thickness, but shorter in length than the 1936 ones; they measure 3'-3" high, 1'-9" thick, and 3'-6" long. Each end stanchion has 1½" stepped corners and squarely abuts the parapet. The eastern stanchion has an added W-beam guardrail that is through-bolted to the stanchion. Although the guardrail partially obscures the name inscription, "Kalauao Springs" can be read beneath it. The western stanchion has no added guardrail and "1945" is inscribed in 3"-high block numbers. The 1966 parapet of the westbound bridge was constructed exactly like the 1966 parapet of the eastbound bridge (see description above).

The substructure of the 1945/1966 westbound bridge was not accessible for close observation due to steep embankments and water in the drainage channel mauka of the bridge.<sup>5</sup> As mentioned above, this spring-fed stream always has water in it. A glimpse of the 1945 substructure design is possible from the median. This portion of the westbound bridge, which carries the two makai lanes, has two spans. The visible part of its central line of support consists of concrete piles, with

<sup>4</sup> State of Hawaii, Department of Transportation, Highways Division, Design Branch, Project No. U-090-1 (9), Drawings 67 & 69, Kalauao Springs Bridge Widening, Sheets 1 & 3 of 6. June 1965.

<sup>5</sup> State of Hawaii, Taxation Maps Bureau, First Division, Zone 9, Section 8, Plat 16. December 1984.

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square cross-sections, topped by a transverse concrete beam or pile cap. The 1945 drawings show the abutment design also consists of lines of piles, but with rock fill placed (at a 1:1 slope) under each abutment's transverse concrete beam. The 1945 drawings also show the upper concrete part of the piles labeled as "Socket Piles"; these have a wider section for insertion of "Untreated Timber Piles" at the lower ends of the composite piles. From the bank of the waterway north of the bridge, there is a view of the substructure's design for the 1966 traffic lane and walkway, although the utility pipes paralleling the highway do not allow for a clear photograph. The added 1966 portion is a single span, utilizing prestressed concrete girders. The bridge abutments of the 1966 design are board-formed concrete on precast concrete pile foundations.

### Site Information

The Kalauao Springs Bridge is located along a primarily urban section of Kamehameha Highway, but the Sumida Farm near the bridge provides a reminder of the original rural character of this area. Mauka of the highway, to the northeast, and wrapping around the Sumida Farm, is the expansive Pearl Ridge Shopping Center, built circa 1969 (with additional phases of development in later years). Sumida Farm is northwest of the bridge, which has several acres of watercress under cultivation, and is an anomaly in this urban area. One spring of the original two Kalauao Springs currently supplies the water for Sumida Farm watercress cultivation. The lower part of the Pearl Ridge Shopping Center is located to the east of the present farm and spring. This development covered one of the springs at Kalauao with pavement, leaving only the existing spring actively flowing.<sup>6</sup> Makai of the highway, to the southeast, is a low-rise strip mall, and to the southwest of the bridge are various commercial establishments, including McDonald's, an automotive shop and two gas stations. The setting around the bridge has changed greatly since its original 1936 construction date. Historic aerial photos show that before World War II the area was rural, with small farm plots in an area slightly larger than that now occupied by Sumida Farm. Surrounding these plots, primarily mauka of Kamehameha Highway, were sugarcane fields. The construction of the additional lanes and bridges in 1945 as well as the 1966 widening of this section of Kamehameha Highway (and all six bridges) accommodated or spurred the post-World War II development of housing and businesses along this corridor.

### Integrity Assessment

The location of the property has not changed. The Kalauao Springs Bridge is on its original site and retains integrity of location.

The setting of the property has changed. When the 1936 bridge was constructed, the area was rural. The bridge was surrounded on all sides by agricultural fields, with only scattered buildings in the vicinity. Further development followed the construction of the close in 1945 bridge. Now the area is urban, with dense commercial development along Kamehameha Highway. The further close proximity of three differing parapet designs creates a confusing view of the bridge. Integrity of setting is not retained.

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<sup>6</sup> Dee Ruzicka, interview with David and Barbara Sumida, March 9, 2006.

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The design, materials, and workmanship of the property are retained. Significant portions of the 1936 and 1945 bridges remain. These retain sufficient levels of the aspects of the form (design) and physical elements (materials), as well as retaining evidence of the skill (workmanship) employed in their construction, to allow the bridge to reflect its historic association. The historic character of the parapets and stanchions is still readily apparent. The 1966 additions to the bridges are quite different in the design of their structure, parapets, and stanchions. This contrast, however, conveys the history of the area and its rapid post-statehood growth. The 1966 sections of the bridges are non-contributing features, but do not obscure the design, materials or workmanship of the historic bridge sections.

The feeling and association of the property are retained. The bridge expresses the historic sense of the time of its construction. The bridge is sufficiently intact to convey its association with the important highway improvements of that period.

The overall integrity of the property remains high, except for the setting.

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## 8. Statement of Significance

### Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- A. Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B. Property is associated with the lives of persons significant in our past.
- C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D. Property has yielded, or is likely to yield, information important in prehistory or history.

### Criteria Considerations

(Mark "x" in all the boxes that apply.)

- A. Owned by a religious institution or used for religious purposes
- B. Removed from its original location
- C. A birthplace or grave
- D. A cemetery
- E. A reconstructed building, object, or structure
- F. A commemorative property
- G. Less than 50 years old or achieving significance within the past 50 years

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**Areas of Significance**

(Enter categories from instructions.)

Transportation  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Period of Significance**

1936 – 1970  
\_\_\_\_\_  
\_\_\_\_\_

**Significant Dates**

1936, 1945, 1966  
\_\_\_\_\_  
\_\_\_\_\_

**Significant Person**

(Complete only if Criterion B is marked above.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Cultural Affiliation**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Architect/Builder**

William R. Bartels (designer of 1945 section)  
Walker & Olund, Ltd. (contractor for 1936 section)  
E. E. Black, Ltd. (contractor for 1945 section)

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**Statement of Significance Summary Paragraph** (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

The Kalauao Springs Bridge is significant at the local level under National Register Criterion A for its association with the history of O’ahu’s road transportation network, as a part of the Kamehameha Highway segment of O’ahu’s belt road system. It is important for its association with the development of this section of Kamehameha Highway and the adjacent Aiea settlement, which grew into a suburb after its initial establishment as the mill village of a sugarcane plantation. This property’s significance in the area of transportation (Kamehameha Highway history), for the period from the 1936 bridge construction through 1970 (when the H-1 Freeway became the main road corridor in this vicinity), also links it to the history of the Honolulu Plantation Company in Aiea.

The State of Hawaii, Department of Transportation (HDOT) confirmed the Kalauao Stream Bridge’s eligibility under Criteria A in their November 2013 publication: “Hawaii State Historic Bridge Inventory and Evaluation” conducted in order to “identify which of the 708 bridges built before 1968...are eligible for listing on the Hawaii State Register of Historic Places (HSRHP).” Specifically, the report stated that the Kalauao Stream Bridge was: “...eligible under Criterion A for its association with post-war developments of the community due to bridge widening in 1966.”

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**Narrative Statement of Significance** (Provide at least **one** paragraph for each area of significance.)

Context and Development History of These Bridges

There are two other related bridges along this segment of Kamehameha Highway, built under the same or similar series of project numbers – Waimalu Bridge and Kalauao Stream Bridge. The Territory of Hawaii, with the aid of federal funds, was responsible for construction of the original Waimalu Bridge, Kalauao Springs Bridge, and Kalauao Stream Bridge in 1936-1937. Waimalu Bridge was part of Federal Aid Project (FAP) No. 9-F, and the Kalauao Springs and Stream bridges were part of National Recovery Highway (NRH) Project No. NRH-9-C.<sup>7</sup>

In 1945, under Hawaii Project No. DA-WR 10 (3), three additional two-lane bridges were built parallel to the 1936 ones, and these new bridges all carried the westbound lanes. The 1966 Kamehameha Highway widening, FAP No. U-090-I (9), included an additional lane on the outboard sides of all six bridges.

Kamehameha Highway

Until 1936, the original alignment of Kamehameha Highway was the only road that provided passage across the ahupuaa (common Hawaiian term for land divisions that typically extend from the mountains to the sea) of Kalauao, Waimalu, and Waimano, between the settlements at Aiea and Pearl City. The pre-1936 alignment of this highway ran east-west along a winding hillside route located on firmer ground, but not as level as the well-watered soils closer to Pearl Harbor. Part of Kamehameha Highway's pre-1936 route between Aiea and Pearl City is the present-day alignment of Moanalua Road. Today's section of Moanalua Road between Kalauao Stream and Moanalua Loop is a new straighter alignment; the pre-1936 Kamehameha Highway route meandered through the present Pearl Ridge Shopping Center and then followed Moanalua Loop. The Kalauao Springs are makai of the original Kamehameha Highway alignment. The marshy lands around Kalauao Springs posed problems for pre-Territorial-period road planners, but were ideal for wetland agriculture.

The Kalauao Springs were two natural springs of percolating water located mauka of the Kalauao Springs Bridge. Commercial farming in the area around these springs dates back to at least the late 1800s, when rice was a primary crop. Before rice cultivation, the springs irrigated taro loi (common Hawaiian term for flooded terraces). Near the end of the nineteenth century, a tannery was located at the springs. In 1928, Moriichi and Makiyo Sumida began farming assorted wetland produce on a two-acre plot of land at the springs that was leased from Kamehameha Schools/Bishop Estate. At this time, the area near the springs contained many small farms growing similar produce -- bananas, taro, rice, and watercress. Through the ensuing years, the Sumida property grew as they acquired neighboring leases and, by 1950, watercress became the sole crop grown. The Sumida Farm is still in operation in the area just mauka of Kalauao Springs Bridge, one of the few agricultural operations in this area to remain as the surrounding land was urbanized.

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<sup>7</sup> Superintendent of Public Works [hereafter, SPW], Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1936 (Honolulu: New Freedom Press) 1937. pp. 10 & 11.

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The course of the area's urbanization started with the idea of realigning Kamehameha Highway through the agricultural land near the Kalauao Springs. Planning for this realignment had been underway for a few years before NRH funds became available in 1933. Road improvements from Honolulu to Pearl City were on the first list for NRH funding, which was a federal grant, with no matching Territorial appropriation required. Within that planned project, the highway section from Honolulu to Aiea had a higher priority, and the remaining section, from Aiea to Pearl City Junction, was to be undertaken "if financially possible."<sup>8</sup> Two years later, this second-priority section (realignment of Kamehameha Highway west of Aiea) still awaited funding. In 1935, Louis S. Cain, Superintendent of Public Works (SPW) for the Territory of Hawaii, submitted a road plan to the U.S. Department of Roads that included the construction of an "additional unit of Kamehameha Highway beyond Aiea, approximately one mile" that was expected to cost \$148,000.<sup>9</sup> In March 1937, the contract amount reported for construction of a longer highway segment (from "Aiea through Pearl City") was \$203,000.<sup>10</sup>

On August 24, 1937, the new alignment of Kamehameha Highway between Aiea and Pearl City was dedicated. This new road passed over the three 1936 bridges, crossing Waimalu Stream, Kalauao Springs, and Kalauao Stream. Because no original drawings were located for the 1936 bridges in this highway segment, their designers are not known. The original 1937 Kamehameha Highway lanes are the present-day two inner lanes of the eastbound half of the highway. The construction firm of Walker & Olund, Ltd. built the section of this 1937 road between about Kaonohi Street and Aiea, including the Kalauao Springs Bridge.<sup>11</sup> See the subsection below for further information about that firm and about the funding for the 1936-1937 Aiea-to-Pearl City highway construction.

In 1945, the Territory of Hawaii, using federal funds, improved Kamehameha Highway between Aiea and Pearl City with the addition of two more traffic lanes, separated by a median from the 1937 two-lane highway. This allowed the 1945 lanes to be dedicated to westbound traffic and the 1937 lanes to carry eastbound vehicles. This improvement project included the 1945 Kalauao Springs Bridge, which was originally a two-lane bridge with matching parapets and stanchions.

William R. Bartels, bridge engineer for the Hawaii Territorial Highway Department, designed the 1945 Kalauao Springs Bridge. Bartels received his education and training in Germany and immigrated to Hawaii in 1932 when he commenced working with the Highway Department; he continued his career there until his retirement in 1958.<sup>12</sup> During that period, he was a prolific and versatile designer, responsible for large and sophisticated bridge construction projects in Hawai'i, including many tee-beam and rigid-frame concrete bridges, as well as the other two bridges (Waimalu Bridge and Kalauao Stream Bridge) along this stretch of Kamehameha Highway. Bartels' name appears on the original 1945 drawings of the Kalauao Springs Bridge as the designer. He designed and checked these drawings, dated June 1945, with the aid of drafters

<sup>8</sup> "Hawaii Road Building Projects Selected," Honolulu Star Bulletin, June 24, 1933. p. 1.

<sup>9</sup> "Cain Submits Road Plan to U.S. Officials," Honolulu Star Bulletin, May 3, 1935. p. 1

<sup>10</sup> "Cain Reveals Road Scheme for 5 Islands," Honolulu Star Bulletin, March 6, 1937. p. 1.

<sup>11</sup> "Aiea Highway Link Dedicated," Honolulu Star Bulletin, August 25, 1937. p. 6.

<sup>12</sup> "TH Honors 4 Veteran Employees," Honolulu Advertiser, July 1, 1958 article at the University of Hawai'i, Hamilton Library, Honolulu Newspapers Clipping Morgue, on microfiche in Biographical section, under: Bartels.

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D. Yanagihara and P. Yamashita. B. F. Rush, the Territorial Highway Engineer at the time, approved the drawings on June 18, 1945.

The 1945 highway and bridge construction, respectively, was carried out under Hawaii Project Nos. DA-WR 10 (2) and DA-WR 10 (3).<sup>13</sup> According to the SPW report after World War II:

During the war years, highway construction activities were limited to the building of new highways, which served as access to military and navy reservations and to those highways, which are part of the strategic network.... As most military and navy reservations are adjacent to and are served by the main public highways, large sums of Federal access money were spent on the latter with the result that all traffic has benefited by these improvements.<sup>14</sup>

The SPW 1945 report explains the term "access money" as 100% Federal funding for military access roads and "those highways which are part of the strategic network."<sup>15</sup> At the end of the war in August 1945, "all proposed access road projects were dropped by the Federal Government . . . ; but access road projects under construction were allowed to continue to their completion."<sup>16</sup> This widened part of Kamehameha Highway improved access between the main part of the Pearl Harbor Naval Base and its outlying activities near Pearl City Peninsula, Waipio Peninsula, and further west.

E. E. Black, Ltd. obtained two separate construction contracts in 1945 for the highway improvements near Aiea. The amount of their contract for the two new Kamehameha Highway westbound lanes was \$381,177.40; and their accepted bid for three new bridges (the 1945 Waimalu, Kalauao Springs, and Kalauao Stream bridges) along this corridor was \$139,207.50.<sup>17</sup> For most of the twentieth century, Everett Earl Black was a well-connected Hawaii businessman, who was Honolulu Gas Company's president, a director of Castle & Cooke, and on the board of Hawaiian Gas Products, Inc., as well as owner of the contracting company.<sup>18</sup> E. E. Black, Ltd. obtained many road and bridge contracts in Hawaii, starting as early as 1931.<sup>19</sup> It continued to be an important construction firm in Hawai'i for most of the twentieth century. In the mid-1990s, a California-based corporation purchased the firm, and a few years later transferred its focus of operations to Guam.<sup>20</sup>

In 1966, the State of Hawaii, Department of Transportation carried out another improvement to this segment of Kamehameha Highway, adding a third lane to both existing two-lane roadways. They accomplished this under FAP No. U-090-I (9). The widening project responded to

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<sup>13</sup> State of Hawaii, Department of Transportation, Highways Division, Design Branch, Project No. DA-WR 10 (3), Plans of Three Bridges on Kamehameha Highway, Drawing 5157.1. June 18, 1945.

<sup>14</sup> SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1946 [Honolulu: author.] [1946]. p. 17.

<sup>15</sup> SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1945 [Honolulu: author.] [1945]. p. 13.

<sup>16</sup> SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1946 [Honolulu: author.] [1946]. p. 17.

<sup>17</sup> Ibid., p. 26.

<sup>18</sup> Michael T. Holmes, *The Specter of Communism in Hawai'i* (Honolulu: University of Hawai'i Press) 1994.

<sup>19</sup> SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1931 (Honolulu: Honolulu Star Bulletin) 1932.

p. 28.

<sup>20</sup> Ronna Bolante, "Can Locals Compete?" *Hawai'i Business*, on website <http://www.hawaiibusiness.com/Hawaii-Business/July-2002>, accessed February 20, 2013.

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numerous complaints about "bumper-to-bumper Kamehameha Highway rush hour traffic past Pearl Harbor," with protests reported at least as early as 1964.<sup>21</sup> The third lane was added on the outer edge (opposite the median) of each roadway. This resulted in the demolition of the outer parapets and stanchions of the 1936 and 1945 bridges and the addition of the extant 1966 parapets, stanchions, and walkways on the outer edge of the new traffic lanes.<sup>22</sup>

### 1930s Kamehameha Highway Funding around Kalauao and Construction Difficulties

The 1930s contract from the Territorial Department of Public Works for the section of Kamehameha Highway that included the Kalauao Springs and Kalauao Stream bridges was awarded for \$153,647.87, with the cost covered by the federal government, as "U.S. Public Works Project No. NRH-9-C."<sup>23</sup> This type of funding was a grant, and the Territory did not have to match the federal money. After the election of Franklin Roosevelt as President in 1932, the federal government responded to the Great Depression with several measures to provide employment.

In June 1933, Congress passed the National Industrial Recovery Act (NIRA). The act was designed to help individual states with a variety of programs including new highway construction.... It was also designed to aid the states in providing unemployment relief for the millions out of work. Under the NIRA of 1933, individual states were able to obtain additional funds through grant programs, such as the National Recovery Highway... program, [under which] the United States Bureau of Public Roads stipulated that portions of the funding should be used for roadside landscaping and to develop shore routes and inland tourist lanes.<sup>24</sup>

This section of Kamehameha Highway did run near part of Pearl Harbor's shoreline, but it certainly was not intended to be primarily a tourist route. Instead it served the resident population; the Territory's SPW noted that upon its "completion the public will have available an improved highway from Honolulu to the fast growing community of Wahiawa."<sup>25</sup> This section was not an easy area for highway construction, due to numerous wetlands in the ahupuaa of Kalauao, Waimalu, Waiiau, and Waimano. The names of all of those ahupuaa contain the word wai (Hawaiian term for water), except for Kalauao, which means "the multitude [of] clouds."<sup>26</sup> These ahupuaa, between the settlements at Aiea and Pearl City, were noted for their extensive irrigated fields in the early Western-contact period (eighteenth and nineteenth centuries). Such wetlands were one reason that the original alignment of Kamehameha Highway had been inland, on ground more topographically varied, but also more solid.

<sup>21</sup> "Pearl City Traffic Saddens Police, Too," Honolulu Star Bulletin, June 22, 1964. p. 3.

<sup>22</sup> State of Hawaii, Department of Transportation, Highways Division, Design Branch, FAP No. U-090-I (9), As Built Plans of Kamehameha Highway Widening, Drawings 1-6 & 58-87. July 22, 1965.

<sup>23</sup> SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1936 (Honolulu: New Freedom Press) [1936]. p. 10.

<sup>24</sup> Irene Jackson Henry and William Henry, Historic American Engineering Record, Veterans Memorial Park and Parkway, Muskegon, Michigan. (Eagle, Michigan: Henry & Henry Preservation and Architectural Consultants) July 1996, on website [lcweb2.loc.gov/pnp/habshaer/mi/mi0400/mi0455/](http://lcweb2.loc.gov/pnp/habshaer/mi/mi0400/mi0455/), accessed June 13, 2012.

<sup>25</sup> SPW, Report to the Governor, Territory of Hawaii, for the Year Ending June 30, 1937 (Honolulu: Porter Printing Company, Ltd.) [1937]. p. 22.

<sup>26</sup> Mary Kawena Pukui, Samuel E. Elbert, & Esther T. Mookini, Place Names of Hawaii (Honolulu: University of Hawai'i Press) 1976. p. 75.

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A newspaper article about the 1937 opening of the "Aiea Highway," the name at that period for this portion of Kamehameha Highway, noted that for the contractors:

A difficult engineering problem was faced in building a durable road bed since the highway skirts Pearl Harbor and in many places passes through former swamp lands. . . . In constructing the highway, it was necessary to lay a lumber mat of 265,000 board feet before putting in the rock sub-base.<sup>27</sup>

Although part of "Aiea Highway" officially opened for traffic on August 24, 1937, there was a mile-long portion where it was "still necessary to detour through Aiea to the old Kamehameha Highway."<sup>28</sup> Despite the ceremonies "marking an important step in territorial highway development," the roadway surface was, at that date, only loose rocks treated with oil, with a plan that "a macadam finish will be applied within one year."<sup>29</sup>

The contracting company that built the Kalauao Springs Bridge and Kalauao Stream Bridge in 1936-1937, along with several miles of connecting highway segments, was the firm of Walker & Olund, Ltd. John Walker, born in Scotland, came to Hawai'i about 1884. Around 1900 he founded his own company, under the name John Walker, Contractor, and the firm has continued to this day, currently under the name Walker-Moody Construction Company, Ltd. Alfred E. Olund, who was born in Minnesota and arrived in Hawai'i by 1912, started working with Walker in 1920. In 1924, the firm was called Walker & Olund, Ltd., which name continued in use until 1939, despite the 1928 death of John Walker. The business did not get renamed Walker-Moody Construction Company, Ltd., until 1941, although Olund had left the firm and Moody had joined it in 1939. Today, Walker-Moody Construction Company's website states that it was "one of Hawaii's largest and most respected construction firms."<sup>30</sup> Some of the landmark projects that the company completed in its early decades include: the Sacred Heart Catholic Church [1914], "the territorial office building [1926], the new Honolulu city hall [1929], Pier 11 [1930], the Territorial hospital for the insane at Kaneohe [1935], the concrete work for the great oil tanks at Pearl Harbor naval base [1924], and the magnificent new home of C. Brewer & Co., Ltd. . . . 1930."<sup>31</sup>

#### Honolulu Plantation Company, Aiea

Before the construction of the 1937 "Aiea Highway," most of the land around Aiea, especially mauka of Kamehameha Highway, was planted in sugarcane. This sugarcane land extended up to about the 500-foot elevation level. A portion of the land makai of the highway was also planted in sugarcane, but here it was typically interspersed with farm plots of various crops and scattered residences. These extensive sugarcane plantings were part of the field system of Honolulu Plantation Company (HPC), a company based in Aiea, which began in 1899 and which had about 6,500 acres under cultivation during the 1920s. HPC lands reached from Waimalu and Halawa Valley down past the Southeast Loch of Pearl Harbor, almost to Bishop Point and Fort Kamehameha at the harbor mouth, as well as east to Kalihi. All HPC-cultivated land was leased,

<sup>27</sup> "Aiea Highway Link Dedicated," Honolulu Star Bulletin, August 25, 1937. p. 6

<sup>28</sup> "New Aiea Road Open August 20," Honolulu Star Bulletin, August 3, 1937. p. 5.

<sup>29</sup> "Aiea Highway Link Dedicated," Honolulu Star Bulletin, August 25, 1937. p. 6.

<sup>30</sup> Walker-Moody Construction Company, Ltd., "The Walker Moody Story – Company History, Start – 1940," on website <http://www.walker-moody.com/inde.php/company-history-start-1940.html>, accessed June 13, 2012.

<sup>31</sup> Ibid. (in Olund biography section).

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with non-contiguous parcels in the eastern section. The only fee-simple land owned by the company was at the mill, main camps, reservoirs, and pump sites.

HPC made its first harvest in 1901. The mill and main plantation community were centered at Aiea, about ½ mile inland from the mouth of Aiea Stream. In 1906, HPC added a sugar refinery to the mill and began producing refined sugar for use locally. HPC was the only producer in Hawai'i that refined its sugar; all other producers shipped their raw sugar out for refining elsewhere, usually to the California & Hawaiian Sugar Company refinery in Crockett, CA. Most of the HPC-refined sugar was used in locally bottled soft drinks and by the pineapple canneries. HPC shipped to the mainland any refined sugar in excess of local demand.<sup>32</sup>

HPC was one of the very few sugar plantations in Hawaii with a year-round water supply that was sufficient for its irrigation needs.<sup>33</sup> About 20 million gallons per day flowed to the surface at the two springs at Kalauao. HPC pumped this water to its upper fields for irrigation, and for fluming, using less than half of the daily supply. The rest flowed into Pearl Harbor.

Although HPC had employee camps scattered about the plantation, Aiea was the hub and main settlement. HPC's refinery and its hospital formed a nucleus for the community of Aiea, which grew up around these facilities. By the mid-1920s, HPC had begun replacing former barracks-type housing facilities with single-family and duplex cottages. The newer cottages provided more privacy, and also had electricity, water, and kitchens in each unit. Individual kitchens were an improvement from the older barracks that had communal kitchens separated from sleeping quarters. In addition, the 1920s cottages were typically on 50' x 80' lots, which allowed space for gardens and fruit trees. The HPC community at Aiea also had churches, baseball fields, volleyball, basketball, and tennis courts, and a general store. Additionally, there was an assured milk supply for the plantation because HPC sponsored a private dairy.<sup>34</sup>

Over the years, HPC lost much of its leased acreage; this included loss of some at Pearl Harbor, in 1907 for the naval base, and additional lands east of Bishop Point, in 1935 for Hickam Field. The military occupied other HPC sugarcane fields during World War II. One author states the military confiscation of HPC land led to its closure in 1947.<sup>35</sup> Another writer notes "post-war urban growth supplied the final blow."<sup>36</sup> After the plantation closed, O'ahu Sugar Company purchased most equipment and obtained leases on the remaining land. California & Hawaiian Sugar Company acquired the Aiea refinery and continued to refine sugar there until 1996, when local bottlers switched to corn syrup for sweetening.<sup>37</sup>

### Reinforced-Concrete Girder Bridges

Reinforced-concrete girder bridges are a type that was common in the early twentieth century. The character-defining features of this type include a monolithic deck and girder system and

<sup>32</sup> William H. Dorrance, *Sugar Islands, The 165-year Story of Sugar in Hawai'i*. (Honolulu: Mutual Publishing LLC) 2000. p. 50.

<sup>33</sup> Jared G. Smith, *Plantation Sketches* (Honolulu: Advertiser Press) 1924. p. 132.

<sup>34</sup> *Ibid.*, pp. 138-39.

<sup>35</sup> Edward D. Beechert, *Working in Hawaii, A Labor History*. (Honolulu: University of Hawai'i Press) 1985. p. 304.

<sup>36</sup> William H. Dorrance, *Sugar Islands, The 165-year Story of Sugar in Hawai'i* (Honolulu: Mutual Publishing LLC) 2000. P. 50

<sup>37</sup> *Ibid.*

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short spans (typically 15 to 40 feet).<sup>38</sup> This type, using cast-in-place concrete girders with reinforcing, replaced earlier concrete arch bridges, which had even more limited spans. This type of bridge was also a more economical choice than concrete arch bridges. From the 1910s through the 1940s, this type was customary in Hawai'i to span short distances. Generally, this type of bridge is eligible under Criterion A, as the historic context above presents, because they are "representative of important public works projects initiated by the Territorial ... government ... constructed at important crossings along a major transportation route or belt road."<sup>39</sup>

The 1936 and 1945 portions of the Kalauao Springs Bridge were relatively short-span, narrow (two-lane) bridges that used cast-in-place reinforced-concrete girders. The portions of the bridges added in 1966 used prestressed girders.<sup>40</sup> A nationwide bridge study notes this combination of bridge types was used for a few widening projects.<sup>41</sup>

### Conclusion

The Kalauao Springs Bridge is eligible for the National Register of Historic Places under Criterion A (Events) as a contributing element to the development of the around the island road system developed by the Territory in the 1930s.

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<sup>38</sup> Parsons Brinckerhoff and Engineering and Industrial Heritage, A Context for Historic Bridge Types, NCHRP Project 25-25, Task 15. (Prepared for the National Cooperative Highway Research Program) October 2005. p. 3-93.

<sup>39</sup> Heritage Center, State of Hawai'i, Historic Bridge Inventory and Evaluation, Draft, 2008. pp. I-71 & I-72.

<sup>40</sup> State of Hawaii, Department of Transportation, Highways Division, Design Branch, FAP No. U-090-I (9), Waimalu Stream Bridge Widening, Drawing 73. June 1965.

<sup>41</sup> Parsons Brinckerhoff and Engineering and Industrial Heritage, A Context for Historic Bridge Types, October 2005. p. 3-93.

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## 9. Major Bibliographical References

**Bibliography** (Cite the books, articles, and other sources used in preparing this form.)

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No drawings or early photographs of the original 1936 bridge were located for this form.

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Historic maps and aerial photos are located in the collection of the Hawai'i State Archives. Aerial photos in the collection of the Hawai'i State Archives were created under contract for the Hawaii Territorial/ State Land Use Bureau.

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*Honolulu Star Bulletin*

"Hawaii Road Building Projects Selected; Work to Start July 1." June 24, 1933. p. 1.

"Allotment to Hawaii Roads is Agreed On." August 3, 1933. p. 1.

"\$2,631,000 To Be Spent For Island Roads." August 16, 1933. p. 1.

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"Cain Submits Road Plan to U.S. Officials." May 3, 1935. p. 1.

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"Ceremony Will Open New Road." August 23, 1937. p. 7.

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Newspaper articles on W.R. Bartels are available at the University of Mānoa, Hamilton Library, Honolulu Newspapers Clippings Morgue, on microfiche in Biographical section under: Bartels. Various Dates.

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**Previous documentation on file (NPS):**

- preliminary determination of individual listing (36 CFR 67) has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings Survey # \_\_\_\_\_
- recorded by Historic American Engineering Record # hi-116
- recorded by Historic American Landscape Survey # \_\_\_\_\_

**Primary location of additional data:**

- State Historic Preservation Office
  - Other State agency
  - Federal agency
  - Local government
  - University
  - Other
- Name of repository: Hawaii DOT, Highways Div. Design Branch

**Historic Resources Survey Number (if assigned):** \_\_\_\_\_

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## 10. Geographical Data

**Acreeage of Property** Less than one acre

Use either the UTM system or latitude/longitude coordinates

### Latitude/Longitude Coordinates

Datum if other than WGS84: \_\_\_\_\_

(enter coordinates to 6 decimal places)

- |              |            |
|--------------|------------|
| 1. Latitude: | Longitude: |
| 2. Latitude: | Longitude: |
| 3. Latitude: | Longitude: |
| 4. Latitude: | Longitude: |

**Or**

### UTM References

Datum (indicated on USGS map):

NAD 1927 or  NAD 1983

- |             |                 |                   |
|-------------|-----------------|-------------------|
| 1. Zone: 04 | Easting: 609540 | Northing: 2364800 |
| 2. Zone:    | Easting:        | Northing:         |
| 3. Zone:    | Easting:        | Northing:         |
| 4. Zone:    | Easting :       | Northing:         |

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**Verbal Boundary Description** (Describe the boundaries of the property.)

The boundary of the Kalauao Springs Bridge is defined by the outer limits of the structures, enclosed by a rectangle measuring approximately 60' x 115' that includes the superstructures and abutments of both the eastbound and westbound bridges.

**Boundary Justification** (Explain why the boundaries were selected.)

The boundary of the property includes all historic features of the bridges that are named Kalauao Spring Bridge.

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**11. Form Prepared By**

name/title: Lorraine Minatoishi, PhD, AIA, President  
organization: Minatoishi Architects  
street & number: 1003 Bishop Street, Suite 1975  
city or town: Honolulu state: Hawaii zip code: 96813  
e-mail LM@mahawaii.com Natalie@mahawaii.com  
telephone: (808)942-7474  
date: March 4, 2020

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**Additional Documentation**

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Kalauao Springs Bridge  
Name of Property

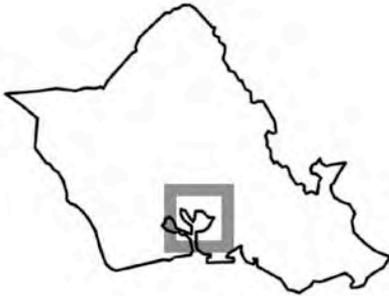
Honolulu, HI  
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#3	HI_Honolulu_Kalauao Springs Bridge_003.jpeg	Location Map
#4	HI_Honolulu_Kalauao Springs Bridge_004.jpeg	Photo Map
#5	HI_Honolulu_Kalauao Springs Bridge_005.jpeg	Historic Aerial
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#7	HI_Honolulu_Kalauao Springs Bridge_007.jpeg	Photo Key

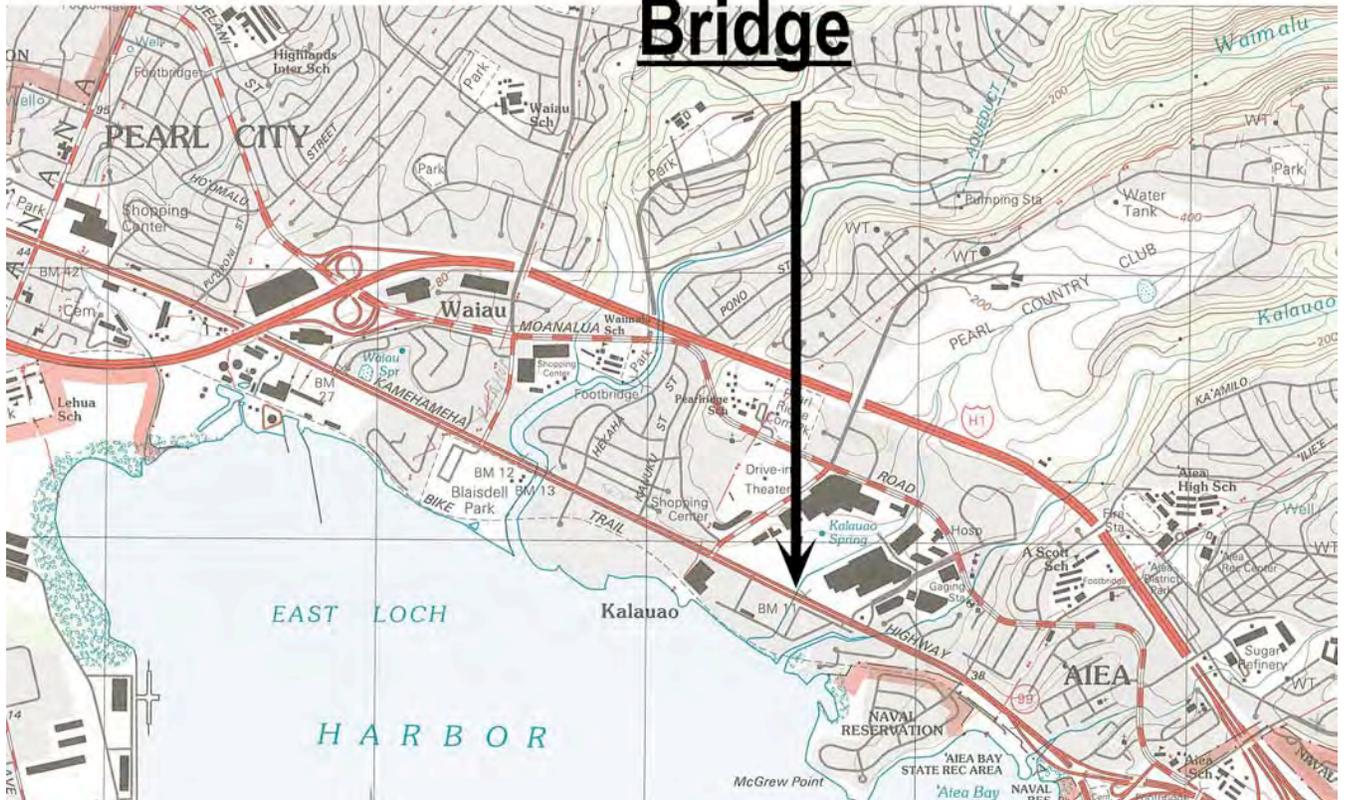
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USGS Map



# Kalauao Springs Bridge



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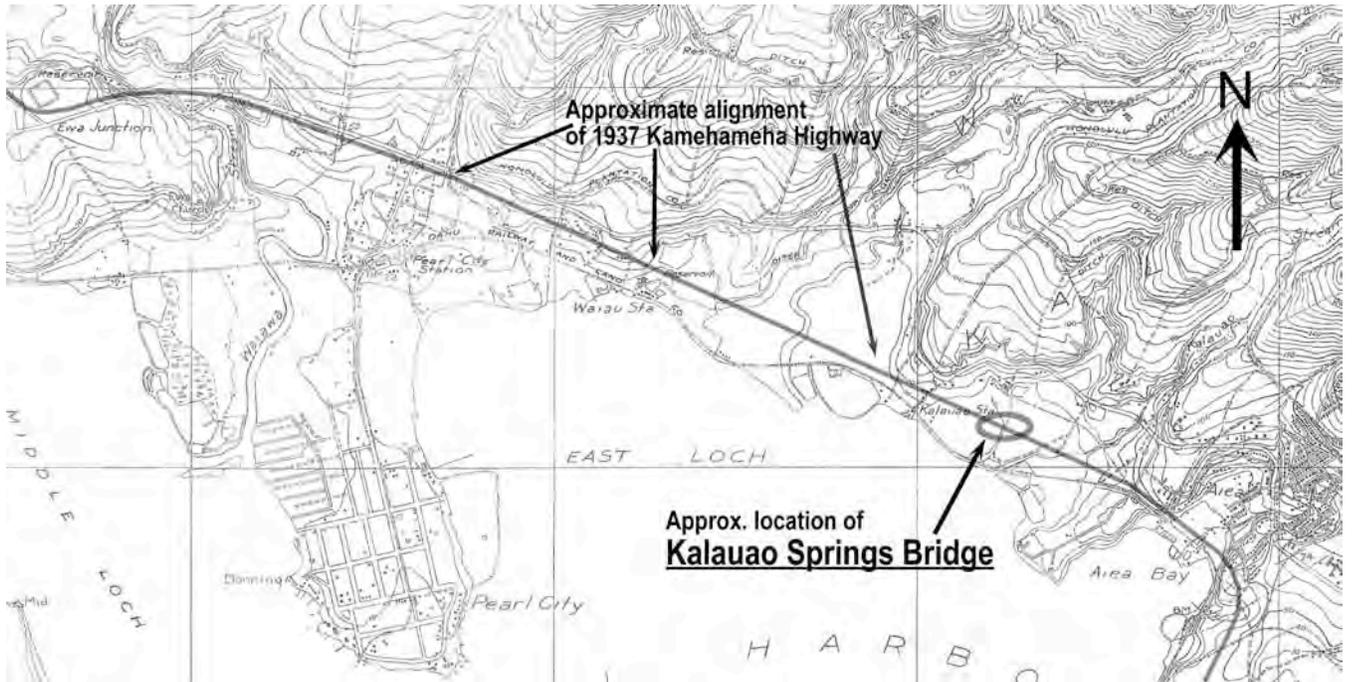
Google Map of Property



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Map of Bridge Site



Kalauao Springs Bridge  
Name of Property

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Photo Map



**Kalauao Springs Bridge**  
**boundary**



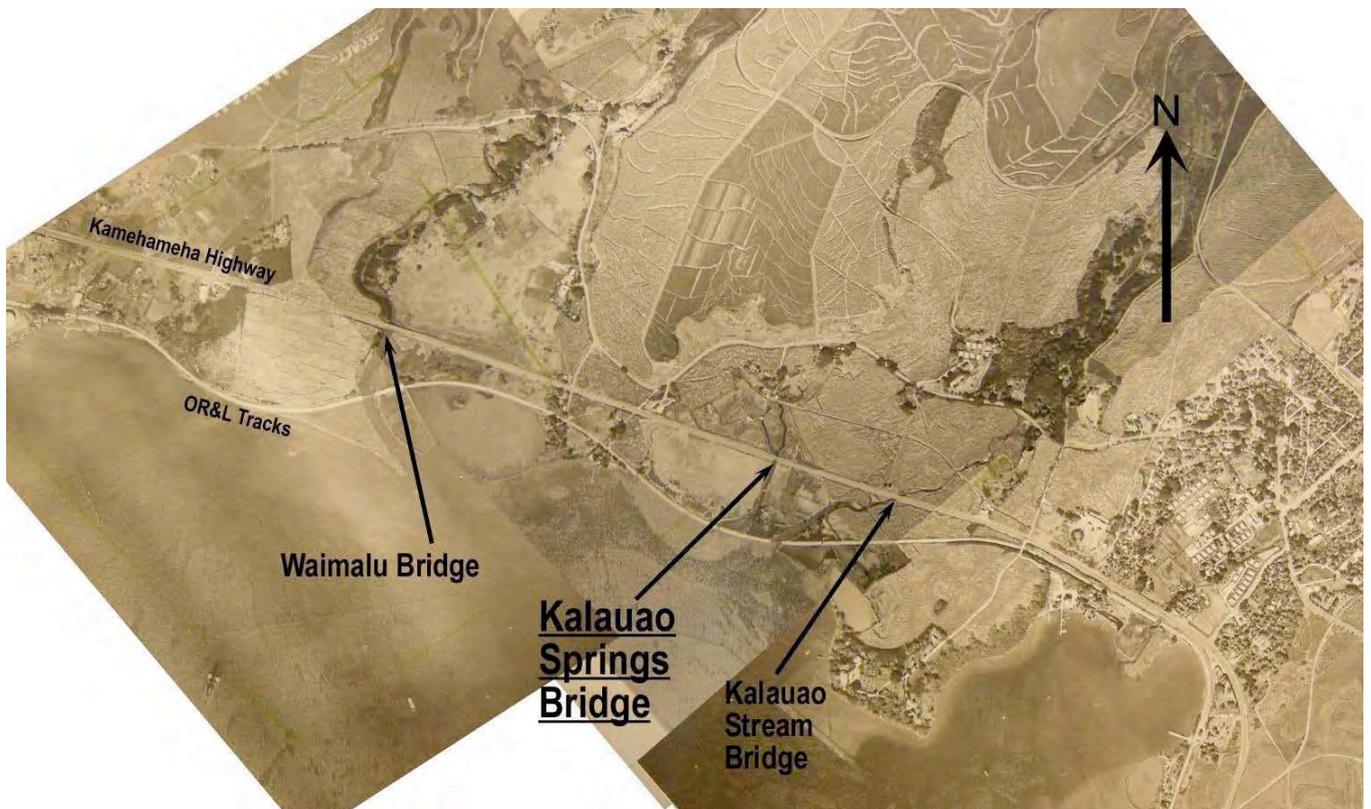
feet 1000  
meters 500



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Historic Aerial Photo of Site



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Aerial Photo of Site

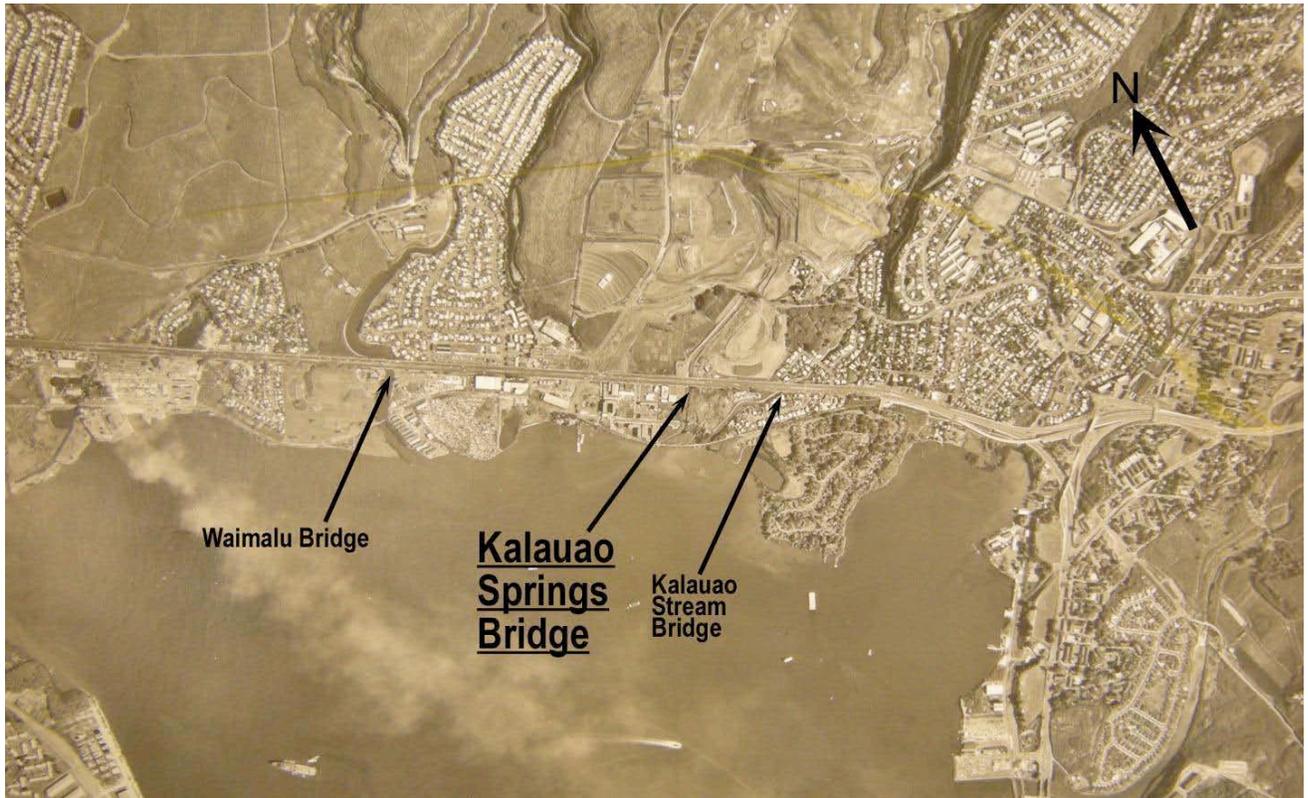
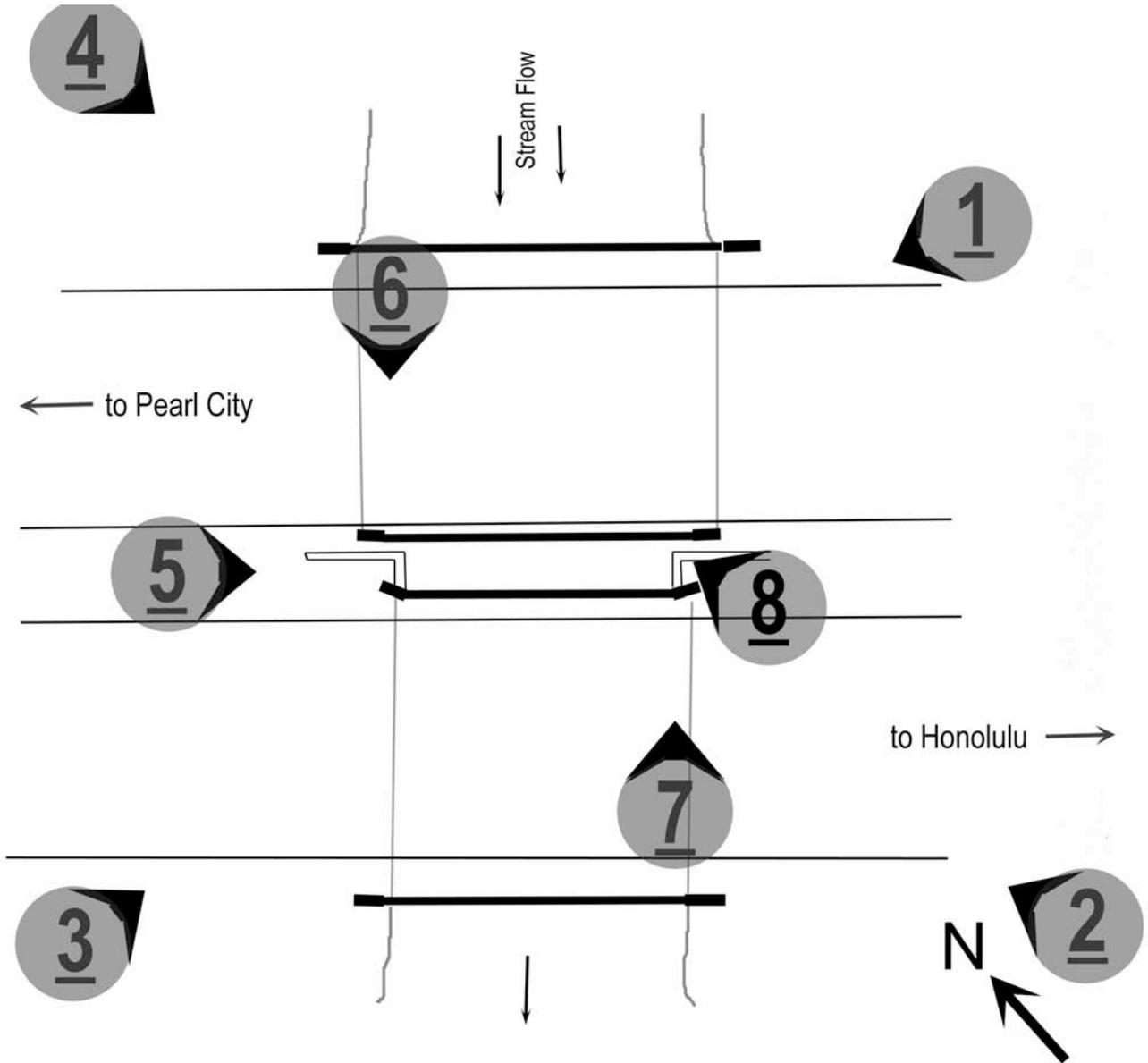


Photo Key



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Photo	File Name	Description
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#7	HI_Honolulu_Kalauao Springs Bridge_014.jpeg	HI_Honolulu_Kalauao Springs Bridge_014.jpeg
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#9	HI_Honolulu_Kalauao Springs Bridge_016.jpeg	HI_Honolulu_Kalauao Springs Bridge_016.jpeg

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Photo: 1 of 8  
Name of Property: Kalauao Springs Bridge  
City or Vicinity: 'Aiea  
Photographer: Stanley Solamillo  
Date Photographed: February 24, 2020  
Description: Overview showing approach to westbound bridge  
Camera Facing: W



Photo: 2 of 8  
Name of Property: Kalauao Springs Bridge  
City or Vicinity: 'Aiea  
Photographer: Stanely Solamillo  
Date Photographed: February 24, 2020  
Description: Overview of eastern end of eastbound bridge  
Camera Facing: N



Photo: 3 of 8  
Name of Property: Kalauao Springs Bridge  
City or Vicinity: 'Aiea  
Photographer: Stanley Solamillo  
Date Photographed: February 24, 2020  
Description: Overview of approach to eastbound bridge  
Camera Facing: E



Photo: 4 of 8  
Name of Property: Kalauao Springs Bridge  
City or Vicinity: 'Aiea  
Photographer: Stanely Solamillo  
Date Photographed: February 24, 2020  
Description: Overview of westbound bridge, camera facing south. Note the 1945 parapet near the center of the photograph and the westbound 1966 parapet on the left.  
Camera Facing: S



Photo: 5 of 8  
Name of Property: Kalauao Springs Bridge  
City or Vicinity: 'Aiea  
Photographer: Stanley Solamillo  
Date Photographed: February 24, 2020  
Description: Detail showing the median and the space between the eastbound bridge's 1936 parapet (right) and westbound bridge's 1945 parapet (left- partially obscured by chain link fence)  
Camera Facing: SE



Photo: 6 of 8  
Name of Property: Kalauao Springs Bridge  
City or Vicinity: 'Aiea  
Photographer: Stanley Solamillo  
Date Photographed: February 24, 2020  
Description: Detail of westbound bridge's 1945 parapet and stanchion with scale device (one-foot increments), camera facing southwest.  
Camera Facing: SW



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Photo: 7 of 8  
Name of Property: Kalauao Springs Bridge  
City or Vicinity: 'Aiea  
Photographer: Stanley Solamillo  
Date Photographed: February 24, 2020

Description: Detail of eastbound bridge's 1936 parapet and stanchion with scale device (one-foot increments), camera facing northeast.

Camera Facing: NE



Photo: 8 of 8  
Name of Property: Kalauao Springs Bridge  
City or Vicinity: 'Aiea  
Photographer: Stanley Solamillo  
Date Photographed: February 24, 2020  
Description: View of westbound bridge's 1945 parapet and makai end of central line of piles and transverse concrete beam (pile cap), camera facing north.  
Camera Facing: N

